Application No. 09/601,955
Attorney Docket 032802-007

REMARKS

Applicants would like to express their gratitude for the courtesy and consideration extended to Applicants' undersigned representative during the telephone interview conducted with Examiner Heitbrink on June 5, 2003. During the interview, Examiner Heitbrink indicated that Claim 33 would be allowable if amended such that portion "(1)" of Claim 33 would have language which corresponds to the language of Claim 1. Examiner Heitbrink also indicated that Claims 1, 36 and 37 are allowable, and that Claims 34, 35 and 57-59 would be allowable subject to the changes to Claim 33 above. Examiner Heitbrink maintained her position that the restriction requirement is proper and would not be withdrawn. The above amendments are implementations of the changes to Claim 33 discussed during the interview..

Conclusion

In view of the preceding discussion, Applicants respectfully urge that the claims of the present application define patentable subject matter and should be passed to allowance. Such allowance is respectfully solicited.

If the Examiner believes that a telephone call would help advance prosecution of the present invention, the Examiner is kindly invited to call the undersigned attorney.

Respectfully submitted,

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Date: June 11, 2003

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Marked-Up Copy of Changes

In the Claims

Claim 33 has been amended as follows:

33. (Once amended) A method for the automated optimization of an injection molding machine set-up process, said machine for manufacturing injection molded parts and including an injection screw and a configurable injection velocity, including the steps of:

(1) determining an optimum fill including:

(i) manufacturing one or more parts with said machine;

(ii) inspecting said parts for defects[;], and

[(iii)] reducing injection stroke in response to any flashing or increasing injection stroke in response to any short shots; and

[(iv)](iii) inspecting said parts for defects, and reducing injection velocity in response to any flashing or increasing injection velocity in response to any short shots[,];

wherein either step [(iv)](iii) is employed after step [(iii)](ii) if step [(iii)](ii) is found to have substantially no effect or substantially no further effect, or step [(iii)](ii) is employed after step [(iv)](iii) if step [(iv)](iii) is found to have substantially no effect or substantially no further effect, thereby reducing said defects;

(2) determining an optimum injection velocity profile, including:

(i) manufacturing one of more parts with said machine;

(ii) determining an injection pressure profile by measuring injection pressure as a function of elapsed injection time with said machine configured with a substantially constant, desired injection velocity;

(iii) measuring injection velocity as a function of elapsed injection time

and determining a profile of said measured injection velocity;

(iv) defining a mean pressure profile from said pressure profile in a regime of substantially constant measured injection velocity profile;

(v) adjusting said velocity profile over at least a portion of an injection velocity phase in response to said pressure profile to reduce differences between said pressure profile and said mean pressure profile, thereby tending to lessen irregularities in said pressure profile.

(3) modifying a post-velocity control phase intermediate set-up obtained after steps (1) and (2) in response to quality defects detected in said parts manufactured with said intermediate set-up to reduce said defects;

(4) a method of reducing kickback to an acceptable level to determine a critical packing/holding pressure, including:

(i) setting an initial packing/holding pressure to a default low pressure;

(ii) performing at least a partial injection cycle;

(iii) determining kickback from changes in screw displacement during said at least partial injection cycle;

(iv) incrementing said initial packing/holding pressure; and

(v) repeating steps (iii) and (iv) if kickback is unacceptably high until kickback is reduced to a predetermined acceptable level, or initial packing/holding pressure reaches maximum machine pressure.

(5) deducing material solidification time from measurements of screw displacement to determine an optimal packing/holding pressure profile, including:

(i) defining a holding time equal to a predetermined default value;

(ii) performing at least a partial injection cycle;

(iii) measuring a pressure stroke being the change in displacement of said screw between packing time and said holding time;

(iv) incrementing said holding time;

(v) repeating steps (iii) and (iv) until said pressure stroke stabilizes or a part so produced is acceptable;

(vi) defining a linear relationship between screw displacement and time consistent with screw displacement at said packing time and at said holding time, between said packing time and said holding time;

(vii) defining a gate freeze time as a time of maximum difference between said screw displacement and said linear relationship, thereby providing a value for said gate freeze time from measurements of said screw displacement;

(6) modifying a post-pressure control phase preliminary set-up obtained after (1) to (5) in response to defects detected in said parts manufactured with said preliminary set-up to reduce said defects.